

Protecting Children from Tobacco Smoke: A Technology Solution for the Home

A Proposal Submitted to the Idaho Millennium Fund Committee

by

College of Health Sciences
College of Engineering

Boise State University
Boise, Idaho

October 10, 2008

Protecting “Marcus” from Tobacco Smoke at Home



Meet Marcus. He is 15-months-old.

By the time Marcus is 2-years-old,
he will inhale **760** cigarettes.

Marcus lives with a smoker — his dad.

If you smoke, don't smoke inside your home or car.
Protect your children. Give them room to breathe.



IDAHO DEPARTMENT OF
HEALTH & WELFARE



Section I

Executive Summary

DATE: October 10, 2008

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PURPOSE: The purpose of the project is to demonstrate that children and other non-smokers can be protected from excessive exposure to indoor second-hand tobacco smoke through the application of modern ventilation technology.

BENEFIT: The primary beneficiary of the technology will be children and other non-smokers living with a smoker.

COST: \$ 18,271

REQUESTED: \$ 18,271

Section II

A. ORGANIZATIONAL BACKGROUND

Boise State University is a comprehensive urban university serving diverse populations through undergraduate and graduate programs, research, and state and regional public service. Boise State University currently educates approximately 19,500 undergraduate and graduate students.

The College of Health Sciences and the College of Engineering are two of eight major academic units on campus. The Colleges are dedicated to providing community service to Idaho with educational programs and research initiatives that increase options for healthful living.

B. PURPOSE OF REQUEST: GOALS AND OUTCOMES

Current Issue:

Smoking in residential environments exposes all family members to significant respiratory health hazards. The most vulnerable populations include small children and pregnant women. Although efforts are being made to encourage persons to quit smoking or to reduce smoking, the success rates are low. However, new technologies are now available that can reduce indoor tobacco smoke. Application of such technology can provide significant protection for these subjected to second hand smoke.

Overall purpose:

The goal of the proposed project is to demonstrate the effectiveness of a new ventilation technology in reducing exposure to second hand tobacco smoke for persons living with a smoker.

The Centers for Disease Control and Prevention (CDC) recommends that tobacco prevention and exposure control efforts be effective and comprehensive. While Idaho has been active in State and Community interventions (e.g., Project Filter), Cessation classes, (e.g., QuitNet), and Management/Administration (e.g., State Tobacco Prevention and Control Program, CHI, TFIA, etc.), Idaho has been deficient in developing adjunct approaches to reducing actual exposure to second-hand tobacco smoke in the home environments. New technologies are now able to control such second-hand smoke in the home environment in a cost-effective manner.

C. ORGANIZATIONAL CAPACITY

The proposed project is consistent with the mission and goals of the Colleges of Health Sciences and Engineering at Boise State University. The investigators have extensive experience in carrying out such demonstration projects. The investigators have experience in community health assessment and have access to the state-of-the art data collection and analysis tools available through the resources of Boise State University

- a. Uwe Reischl, PhD, MD, is a public health physician and professor in the Graduate Program of the College of Health Sciences at Boise State University. He will serve as the principal investigator for this project. He has over 25 years of field experience in occupational medicine and public health research. He has published extensively in national and international public health journals and served as consultant to a number of international public health organizations.
- b. Sin-Ming Loo, PhD, is a computer and electrical systems engineer, associate professor of Electrical and Computer Engineering and Director of the Federal Aviation Administration National Center of Excellence for Research Transport Environment at Boise State University. He has over 10 years experience in the design, testing, and evaluation of new sensor technologies. He will serve as project co-investigator.
- c. Conrad Colby, PhD, RRT, is a respiratory physiologist and Emeritus Professor of Health Sciences in the College of Health Sciences at Boise State University. Dr. Colby has 32 years of professional, clinical, and academic experience in respiratory care. He is a leader in local, regional, and state smoking cessation initiatives and program evaluation efforts in Idaho. He will serve as project consultant.

D. PROCESS

The projected timeframe of the proposed project is listed in sequence below and the time-frame for completion is illustrated in Table 1.

1. Two volunteer families will be selected to participate in a 6-month indoor air quality assessment. Their smoking habits will be evaluated.

2. One family will be selected as a “control”, i.e., tobacco smoke concentrations will be monitored 24/7 for 6 months, but no additional ventilation technology will be provided.
3. The other family will serve as the “intervention” family, i.e., their tobacco smoke concentrations will also be monitored 24/7 for 6 months. However, this family will be provided with an energy recovery ventilation system that will remove tobacco smoke from the indoor air.
4. Findings and outcomes will be documented and described using text, tables, and charts where appropriate.
5. A PowerPoint presentation including appropriate hand-outs for presentation to the Millennium Fund Committee will be developed. The visual presentation will augment an oral presentation.

Table 1
Project Time Table

Time Period	2009						2010					
MONTH	J	A	S	O	N	D	J	F	M	A	M	J
Home ventilation assessment	X	X										
Family selection	X	X										
Technology purchase			X	X								
Technology integration				X								
Technology installation					X							
Data collection					X	X	X	X	X	X		
Data analysis						X	X	X	X	X	X	
Report Writing											X	X
Presentation of Findings												X

E. Evaluation Plan

Two methods of evaluation will be used for this study.

Process evaluation. The investigators will assure that the proposed timelines are being met and that the final output is delivered as planned.

Outcome evaluation. The proposed program is an “applied” technology intervention project. The outcome measure will be the 6-month tobacco smoke concentrations observed in both homes and the total time of ventilation required to maintain safe indoor air quality conditions.

Our findings will be disseminated to interested individuals and groups including, but not limited to the following:

American Cancer Society
American Lung Association
American Heart Association
Coalition for a Healthy Idaho
The Idaho Tobacco Prevention and Control Program
The Idaho Public Health Districts
The Office of Smoking and Health (CDC)
Tobacco Free Idaho Alliance
Idaho Homebuilders Association
Idaho Department of Health and Welfare

The final report will be submitted for consideration by a professional journal. The acceptance of peer-review will be used as an evaluation indicator. Publication in a peer reviewed journal will validate the authenticity of the project.

F. SUSTAINABILITY

The subject matter will be of keen interest to healthcare professionals seeking to help parents reduce their children’s exposure to second hand tobacco smoke in homes. This strategy may provide an excellent supportive technology for parents who are in the process of reducing their smoking habit.

Section III

BUDGET

Table 2 is excerpted from the “Project Budget and Personnel Cost Detail Tables” found in the Applicant Summary and Scoring Sheet Microsoft Excel Workbook provided by the Millennium Committee.

Table 2
Project Budget

Project Budget	Other Funding Sources				
	Millennium Fund	Federal Grant	Local Grant	Receipts from Sales	TOTAL
Personnel Costs					
Salaries	\$ 8,395				\$ 8,395
Benefits	\$ 2,031				\$ 2,031
Total Personnel Costs	\$ 10,426	0	0	0	\$ 10,426
Operating Expenditures					
Total Operating Expenditures		0	0	0	
Capital Outlay					
1. 2 Sensor systems	\$1,500				\$1,500
2. 1 Ventilation System	\$1,800				\$1,800
3. 2 Data Loggers	\$1,500				\$1,500
Total Capital Outlay	\$ 4,800	0	0	0	\$ 4,800
Trustee Benefit Payments					
Total T/B Payments	\$ 3,045				\$ 3,045
TOTAL BUDGET	\$ 18,271	0	0	0	\$ 18,271
% TOTAL	100.0%	0.0%	0.0%	0.0%	100.0%

Table 3
Projected Personnel Costs

Personnel Costs Detail Budget					
		(Salary)	Other Funding Sources		
Position Title	Staff Time	Millennium Fund			Total
1. Project Director	0.4 month	\$ 2,447			\$ 2,447
2. Project Co-investigator	0.4 month	\$ 3,948			\$ 3,948
3. Consultant		\$ 2,000			\$ 2,000
TOTAL			0	0	\$ 8,395

BUDGET NARRATIVE

Dr. Reischl will serve as the project director. He will receive \$2,447.00 as partial summer salary. Dr. Loo will serve as a project co-investigator and he will receive \$3,948.00 as partial summer salary. Dr. Colby will serve as consultant receiving a total of \$2,000 for his contributions with no university fringe benefits.

A total of \$4,800 will be needed to purchase and install the smoke sensors and energy recovery ventilation system in the homes.